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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: A COLOURING COMPOSITION

(57) Abstract

A composition and method for dyeing natural or synthetic material or blend thereof. The composition comprises an organic pigment, a thermoplastic resin, optionally a plasticizer, a solvent and optionally a conventional propellant. The method of application is preferably by means of an aerosol spray can.

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A COLOURING COMPOSITION

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This invention relates to colouring compositions, and in particular colouring compositions for use in dyeing carpets in motor vehicles.

Natural or synthetic materials or blends thereof can either be dyed prior to being manufactured into a finished product, or can be dyed during manufacture. Examples of such dyed materials are textile fabrics and carpets.

On a commercial basis carpets are dyed using known pigment compositions and the carpet is then dried by hot-air exhaustion techniques. This method whilst suitable for the initial dyeing of carpets is cumbersome and time consuming and is not readily adaptable to the dyeing of carpets on a small scale.

Present methods of dyeing carpets in situ, require the use of a machine or apparatus for applying a liquid dye which must then be allowed to dry. This method of dyeing carpets still involves the use of a machine or apparatus and is time consuming. An additional disadvantage is that carpets which have been dyed, in situ, have a tendency to lose the new colour which is rubbed off the pile when the carpet is walked on.

The present invention seeks to substantially alleviate the above disadvantages.

According to the present invention there is provided a dyeing composition comprising 1-15% by weight of a colouring component incorporating one or more organic pigments; 1-10% by weight of a fixative component comprising at least one



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thermoplastic resin and optionally a liquid plasticizer; 30-70% by weight of a drying component selected from optionally halogen substituted aliphatic or aromatic hydrocarbons and oxygenated solvents; 0-3% of odourant component; and propellant as required; the composition being suitable for application, to a natural or synthetic material or blend thereof to be dyed, either in the form of an aerosol composition or otherwise.

In a preferred aspect, the said composition is used as an aerosol spray in association with one or more conventional propellants. In this aspect, the components are desirably chosen from those specifically set forth hereafter.

The invention also provides a method for applying a composition preferably by means of an aerosol spray can suitable for application to natural or synthetic material or blend thereof.

The preferred features of the invention will be sequentially described hereafter with reference to embodiments.

Examples of pigments are:- carbon black; metal oxides eg. yellow iron oxide, titanium dioxide; benzidine yellow; red B toner; phthalocyanine blue and phthalocyanine green.

Fixatives are selected from: thermoplastic resins having a m.p. in the range of 65°C - 150°C for example: liquid epoxy resin with an epoxide equivalent (175-210), vinyl-chloride - vinyl acetate copolymer, vinyl-toluene -



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acrylate copolymer, and liquid plasticizers for example chlorinated hydrocarbons and chlorinated paraffins; ester types for example phthalates and adipates.

Odourants are selected from natural or synthetic perfumes for example citrus esters or floral esters.

Examples of solvents are selected from: optionally halogen substituted aliphatic, aromatic hydrocarbons; oxygenated solvents, a particularly preferred solvent is toluene,

propellants are selected from fluorocarbons or hydrocarbons.

A preferred embodiment of the present invention comprises: to 100% total weight

colouring component	- pigment	1 - 10%
fixative component	- thermoplastic resin	2 - 8%
	liquid plasticizer	0 - 2%
drying component	- solvent	balance
odourant	- natural or synthetic	0 - 3%
	perfume	
propellant	- propellant	30 - 50%

A number of tests were conducted on the compositions of the present invention to determine their stability to heat or light and also their colour fastness.

In one test, samples of the compositions were cooled to -20°C and kept at that temperature for four hours before being allowed to warm to room temperature. Other samples were heated to 50°C and kept at that temperature for four



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hours before being allowed to cool to room temperature. When the samples were again at room temperature, they were inspected for decomposition or separation and were then applied to a piece of carpet. It was found that the samples of the compositions of the present invention did not alter with change in temperature and performed in a normal fashion.

In another test a number of carpet squares ranging from pure wool through blends to pure nylon were sprayed with samples of the compositions. The carpet squares also had a range of pile from tufted to shag pile. The samples of the compositions tested covered a wide colour range and the dyed carpets were inspected for colour coverage, colour fastness, and final texture. From the tests the pure nylon and synthetic blends appeared better than wool in coverage and texture. The least satisfactory was a wool shag pile which required more dye than other carpets and resulted in a slightly matted texture rather than remaining soft and fluffy. Whilst the finish was not unacceptable and was improved by the addition of a liquid plasticizer to the composition; it was clear from the tests that compositions of the present invention behaved better on short loop or close cut pile, acrylic or wool-acrylic carpet.

Some of the dyed carpets were then placed outside in the sunlight and others placed in the sunlight under glass in order to test fading or change in colour. It was found that greens reds and blues became lighter on exposure to ultra violet rays whilst the camel colour got darker. It



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was however apparent that fading was not a problem with the compositions.

Further tests were carried out on dyed carpet squares to test for colour fastness. In these tests, vaseline (Registered Trade Mark), butter and water were seperately rubbed into a carpet to check for bleed-out of colour. There was found to be no bleed-out with water and only a minor bleed-out with vaseline or butter.

In order to determine colour wear a carpet square was subjected to intensive brushing with a hard brush for 30 minutes until the colour was partially removed. It was estimated that the brush test was equivalent to the expected life of the carpet and the result was clearly satisfactory.

The compositions of the present invention are particularly for use in treating carpets used in motor vehicles. For this reason it was decided to conduct further tests to determine coverage on soiled carpets.

A number of used, soiled and worn carpets were taken and after being vacuumed were sprayed with compositions of the present invention. It is obvious that the substrate colour has an influence on the final colour and that it is preferable to dye darker rather than lighter. In addition it is not possible to restore the pile to charred carpet caused by cigarette burns. A range of colours were tested and it was surprisingly found that the spray gave body to the carpet and with normal soiling the carpet came up very well, even charred carpet was recoloured. Except with heavily oil



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stained carpets the compositions of the present invention were found to cover most stains satisfactorily.

Whilst the present invention has been described herein with particular reference to the dyeing of carpets by means of an aerosol spray it is to be understood that the invention is of wider application, for example compositions of the present invention have been used to dye calico and sheepskins and have even been used as a medium to paint pictures.

The following examples illustrate the invention:

Example 1 - Black

The following components are weighed:

9 kg furnace carbon black

11.0kg vinyl chloride vinyl acetate copolymer

1.2kg liquid epoxy resin with an epoxide equivalent (175-210)

100.0kg methyl ethyl ketone (mek)

30.0kg methyl iso-butyl ketone (mibk)

75% of the vinyl resin is mixed into 75% of the solvents with a mechanical stirrer until dissolved.

The epoxy resin and pigment are then added and the resulting mixture is passed through a horizontal bead mill to evenly disperse the pigment throughout the resin and plasticizer (if any).

Then 3.6 kg of vinyl resin is mixed with 5kg of mibk and 20kg of mek until dissolved. This solution is passed through the bead mill as a let down.



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5kg of mibk and 15kg of mek are mixed together and passed through the bead mill as a wash down.

All mixtures and solutions are returned to the mechanical stirrer and the total weight is brought up to the batch weight of 200kg by addition of mek as necessary.

After mixing, the composition is transported to an aerosol filler where it is again stirred before being added in metered amounts of 150g to aerosol cans.

Valves are clamped into position and propellant 12, Registered Trade Mark, 150g is added to the cans. The cans are then hot water tested before being packed.

As described above the following components in a percentage by total weight of composition were mixed together and placed into an aerosol can which was then sealed.

Example 2 - Camel

colouring component	- titanium dioxide	5.8)
	- benzidine yellow	1.2)
	- furnace carbon black trace)	7.1
	- red B toner	0.1)
fixative component	- epoxy resin (as above)	0.3
	vinyl resin (as above)	2.6
drying component	- mek	30
	mibk	10
Propellant	- propellant 12	50

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Example 3 - Blue

colouring component	- phthalocyanine blue	3.0)
	titanium dioxide	3.5) 6.6
	furnace carbon black	0.1)
fixative component	- epoxy resin (as above)	0.3
	vinyl resin (as above)	3.1
drying component	- mek	30
	mibk	10
propellant	- propellant 12	50

Example 4 - Green

colouring component	- phthalocyanine blue	1.2)
	titanium dioxide	3.0) 6.0
	beuzidine yellow	1.8)
fixative component	- epoxy resin (as above)	0.3
	vinyl resin (as above)	2.7
drying component	- mek	31
	mibk	10
propellant	- propellant 12	50

Example 5 - Red

colouring component	- red B toner	3.6
fixative component	- epoxy resin (as above)	0.3
	vinyl resin (as above)	2.1
drying component	- mek	11.0
	mibk	33.0
propellant	- propellant 12	50

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Example 6 - Camel with odouriser

colouring component	- titanium dioxide	2.0)
	yellow iron oxide	5.3) 7.4
	red oxide	0.1)
	furnace carbon black trace)	
fixative component	- vinyl-toluene-	3.5
	acrylate copolymer	
	Cereclor 42 (Registered	0.4
	Trade Mark)	
drying component	- toluene	12.0
	methylene chloride	46.2
odourant	- citrus ester	0.5
propellant	- butane	30



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The claims defining the invention are as follows:

1. A dyeing composition comprising 1-15% by weight of a colouring component incorporating one or more organic pigments; 1-10% by weight of a fixative component comprising at least one thermoplastic resin and optionally a liquid plasticizer; 30-70% by weight of a drying component selected from optionally halogen substituted aliphatic or aromatic hydrocarbons and oxygenated solvents; 0-3% of odourant component; and propellant as required; the composition being suitable for application, to a natural or synthetic material or blend thereof to be dyed, either in the form of an aerosol composition or otherwise.
2. A dyeing composition as claimed in claim 1 comprising 2-10% of the colour component, 2-4% of the fixative component, 40-60% of the drying component, 0-2% of the odourant component, and 30-50% of propellant, the components being formulated as an aerosol composition.
3. A dyeing composition as claimed in claim 1 or 2 wherein the organic pigment(s) is(are) selected from those specifically set forth herein.
4. A dyeing composition as claimed in any one of claims 1 to 3 wherein the thermoplastic resin has a melting point in the range of 65-150°C and is selected from liquid epoxy resins with an epoxide equivalent (175-210), vinyl-chloride-vinyl-acetate copolymers, and vinyl-toluene-acrylate copolymers.



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5. A dyeing composition as claimed in any one of the preceding claims wherein the liquid plasticizer is a chlorinated hydrocarbon, a chlorinated paraffin and/or an ester.

6. A dyeing composition as claimed in any one of the preceding claims wherein the dyeing component is selected from methyl ethyl ketone, methyl iso butyl ketone, toluene, methylene chloride.

7. A dyeing composition according to claim 1 and substantially as herein described with reference to any one of the foregoing examples thereof.

8. A method of dyeing a natural or synthetic material or blend thereof wherein there is applied, thereto, the composition as claimed in any one of the preceding claims.

9. A method as claimed in claim 8 wherein there is applied, to the material or blend being dyed, an aerosol composition as claimed in claim 2.

10. A method as claimed in claim 8 or 9 wherein the material or blend being dyed is carpet material.

11. A method as claimed in claim 8 or 9, and substantially as herein described with reference to any one of the foregoing specific examples thereof.



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INTERNATIONAL SEARCH REPORT

International Application No PCT/AU 83/00100

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) *

According to International Patent Classification (IPC) or to both National Classification and IPC -
Int. Cl.³ D06P 1/52, D06P 1/90, C09K 3/30// C09K 3/00,

II. FIELDS SEARCHED

Minimum Documentation Searched *

Classification System	Classification Symbols
IPC	D06P 1/52, 1/90, C09K 3/30, 3/00

Documentation Searched other than Minimum Documentation
to the Extent that such Documents are Included in the Fields Searched *

AU: IPC as above plus C07D 11/00

III. DOCUMENTS CONSIDERED TO BE RELEVANT **

Category *	Citation of Document, * with indication, where appropriate, of the relevant passages **	Relevant to Claim No. *
X	AU, A, 76565/81 (SHACHIHATA INDUSTRIAL CO., LTD.) 18 November 1982 (18.11.82)	(1)
X	GB, A, 1564098 (TROYFEL PRODUCTS LTD.) 2 April 1980 (02.04.80)	(1)
A	AU, A, 56033/69 (STANDARD TELEPHONES AND CABLES PTY. LTD.) (1-11) 10 December 1970 (10.12.70)	(1-11)
X	GB, A, 1211149 (CIBA LTD.) 4 November 1970 (04.11.70)	(1)
X	FR, A, 1422325 (TIVAL TEINTURES, IMPRESSIONS, BLANCHIMENTS DES VOSGES ET D'ALSACE) 15 November 1965 (15.11.65)	(1)
X	AU, B, 42749/64 (279902) (CIBA LTD.) 7 October 1965 (07.10.65)	(1)
X	AU, B, 10175/61 (263974) (J.R. GEIGY A.G.) 2 May 1963 (02.05.63)	(1)
A	AU, B, 67642/60 (249885) (BADISCHE ANLIN AND SODA-FABRIK A.G.) 20 February 1962 (20.02.62)	(1-11)

* Special categories of cited documents: **

- "A" document defining the general state of the art which is not considered to be of particular relevance
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IV. CERTIFICATION.

Date of the Actual Completion of the International Search *

24 October 1983 (24.10.83)

Date of Mailing of this International Search Report *

31 October 1983

International Searching Authority *

Australian Patent Office

Signature of Authorized Officer *

A.S. Moore

A.A. Moore

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

- | | | |
|---|--|--------|
| A | GB, A, 669739 (INTERCHEMICAL CORPORATION) 9 April 1952
(09.04.52) | (1-11) |
| A | AU, B, 19946/48 (145272) (IMPERIAL CHEMICAL INDUSTRIES)
24 June 1948 (24.06.48) | (1-11) |

V. OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE¹⁰

This International search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. Claim numbers _____ because they relate to subject matter¹² not required to be searched by this Authority, namely:

2. Claim numbers _____, because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful International search can be carried out¹³, specifically:

VI. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING¹¹

This International Searching Authority found multiple inventions in this International application as follows:

1. As all required additional search fees were timely paid by the applicant, this International search report covers all searchable claims of the International application.
2. As only some of the required additional search fees were timely paid by the applicant, this International search report covers only those claims of the International application for which fees were paid, specifically claims:
3. No required additional search fees were timely paid by the applicant. Consequently, this International search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:
4. As all searchable claims could be searched without effort, justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

- The additional search fees were accompanied by applicant's protest.
- No protest accompanied the payment of additional search fees.